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REMARKS**Rejection of Claims and Traversal Thereof**

In the December 18, 2002 Office Action,

claims 21, 26-27 and 51-58 were rejected under 35 U.S.C. §112, first paragraph;

claims 21, 26-27, 55-58 and 61 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,405,590 issued to Macado, et al.;

claims 21, 26-27 and 55-58 and 61 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,147,756 issued to Dahlstrom, et al.; and

claims 21, 26-27 and 51-58 and 61 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,019,818 issued to Knapp.

These rejections are hereby traversed in respect of the pending claims 21, 26-27, 51-54, 57-58 and 61-62 as amended herein.

Reconsideration of the patentability of the pending claims is therefore requested in light of the following remarks.

Rejection under 35 U.S.C. § 112, first paragraph

In the December 18, 2002 Office Action, claims 21, 26-27 and 51-58 were rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants will address each statement of rejection separately.

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Applicants insist that there is sufficient disclosure in the specification for one skilled in the art to understand that "the scrubbing liquid in the second scrubbing zone contains no caustic chemical injection agent." Specifically, applicants discuss at page 46, lines 5-7 and 20-21, that the two stage scrubber system does not require the use of chemical injection agents. The term "chemical injection agents" certainly includes a caustic agent. The present invention is defined at page 20 of the specification, as comprising one or more compatible aspects and it is disclosed that the water scrubbing can be conducted with or without chemical augmentation, such as KOH or NaOH (either of which is certainly considered a caustic reagent).

Although the present specification provides ample guidance and enablement for one skilled in the art to practice the claimed two stage scrubbing process without the inclusion of a caustic agent, nonetheless, to advance the prosecution of this application, claims 51, 53-54 have been amended to recite that the scrubbing solution "contains no chemical injection agent." (emphasis added). The Office has stated that the specification provides ample support for such "chemical injection agent" terminology, and thus, this rejection is fully overcome.

According to the Office, "neutral water is used for removing silane, not for the 2-step process." Applicants direct the Office's attention to page 55, line 19 of the specification, where it clearly states that the cleaning of silane can be conducted in the two scrubber system. Thus, if neutral water can be used for cleaning silane in a one stage scrubber, one skilled in the art would certainly know that neutral water can be used in a two stage scrubber, especially because the specification expressly states that silane can be cleaned in the two stage system. Notwithstanding the fact that applicants' specification provides ample support for the use of "neutral" water in the claimed two stage scrubbing system, applicants have amended claim 52 to remove the term 'neutral' to move the prosecution of this application forward to allowance.

Claims 21 and 26 have been amended to recite that the "second scrubbing zone has a smaller diameter than that of said first scrubbing zone." Further, claims 57-58 have been amended to recite that "the diameter of the second contacting chamber is less than one-fifth the diameter of the first contacting chamber" according to the suggestion of the Office. Thus, the amendment of claims 21, 26 and 57-58 obviates the rejections under 35 USC §112, first paragraph.

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Applicants submit that all currently pending claims satisfy all requirements under 35 U.S.C. 112, first paragraph. Withdrawal of all disclosure based rejections is respectfully requested.

Rejection under 35 U.S.C. 103(a)

All pending claims were rejected under 35 U.S.C. §103(a) as being unpatentable over three references (Macado, et al., Dahlstrom, et al., and Knapp). These references were not combined, but were individually cited against the pending claims. Applicants traverse these rejections and submit that none of the cited references renders applicants' claimed invention *prima facie* obvious.

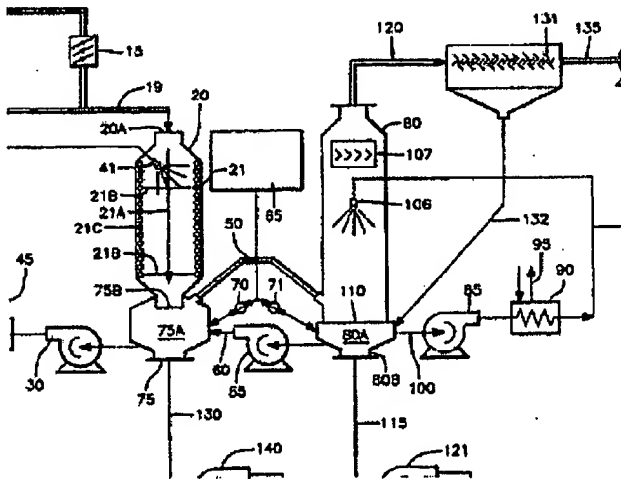
The presently claimed invention relates to an abatement system that comprises a first scrubbing unit, wherein the effluent gas is flowed co-currently with a scrubbing liquid to remove gases and solids. From the first stage scrubber unit, the partially treated gas flows to a second stage scrubber unit. The second scrubbing unit has a smaller diameter than the first stage scrubber unit. The smaller size of the second scrubbing unit, due to the smaller volume constraints, enables proper wetting with a lower water flow rate. Further, the efficiency of the two stage scrubber is high and allows the system to operate without using chemical injection agents and/or large amounts of fresh water.

The Office admits that none of the cited references, that being Macedo, et al., Dahlstrom, et al., and Knapp, discloses a second scrubbing unit that is smaller than the first scrubbing unit. However, the Office contends that the cited references teach a two stage scrubbing system and that it would have been obvious to one having ordinary skill in the art to optimize the size of the scrubber units to obtain the best results. Further, the Office states "[g]ranted that in the figures, the second scrubbing unit in Dahlstrom and Macedo was shown bigger than the first column, however, the figures are not to scale, the second column might have been drawn bigger in order to clearly shown [sic] all the details." (emphasis added) Applicants submit that the Office's assumptions regarding the drawings in the prior art do not constitute the disclosure of the prior art, especially in light of the fact that the prior art is completely silent regarding the size of the second scrubber, as stated by the Office several times in the December 18, 2002 Office Action. The speculation by the Office that the drawings may be enlarged to

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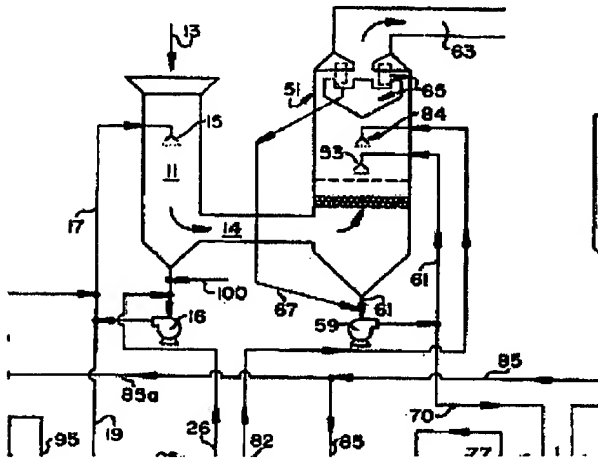
enhance details is completely unfounded. Even more to the point, the cited prior art never even once discusses the enlargement of only a small section of the figures and applicants therefore are entitled to rely on what is actually depicted in the drawings of the references free of any unfounded speculation by the Office that the drawings are or could be misrepresentative of what they actually show. The Office therefore is predicated obviousness on speculation and not on which is known or ascertainable from a fair reading of the references. The law is well settled that "[O]bviousness cannot be predicated on what is unknown." (*In re Rijckaert*, 28 USPQ2d 1955 (Fed. Cir. 1993) citing *In re Spormann*, 150 USPQ 449 (CCPA 1966))

In viewing Figure 1 of Macedo, et al. double scrubber system, recreated below for ease of reference, it is evident that the second scrubber is as large or larger than the first scrubber. The Macedo, et al. reference does not discuss the size of the second scrubber and only provides the depiction of the system recreated below, showing that the second scrubber is larger than the first scrubber unit. Further by viewing recreated Figure 1, it is evident that the second scrubber is not enlarged to show better detail, as speculated by the Office. Clearly, Macedo, et al. does not recognize that a smaller size of the secondary scrubber provides several advantages and benefits, including reduced water use.



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Likewise, Dahlstrom, et al. does not discuss the size of the scrubber, however, as depicted in the drawing of the system of Dahlstrom, et al. shows a second scrubber that is larger than the first scrubber. Since, Dahlstrom, et al. does not mention the size of the scrubber, the only guidance relating to size is in the drawings. Considering the size of the second scrubber, Dahlstrom, et al. also fails to recognize the advantages and benefits of a second scrubber having a smaller diameter.



Knapp describes a single downflow apparatus which functions both as a quencher and a packed bed scrubber wherein the contaminated gas is cooled and contaminants are removed simultaneously. At column 2, lines 20-40 of Knapp, the object of the Knapp's invention is described as the simultaneous quenching and scrubbing in a unitary structure. The Office makes reference to column 3, first full paragraph of the Knapp specification as suggesting a second scrubbing unit, however, such paragraph only discusses the addition of a polishing scrubber to further purify the gaseous products, stating that:

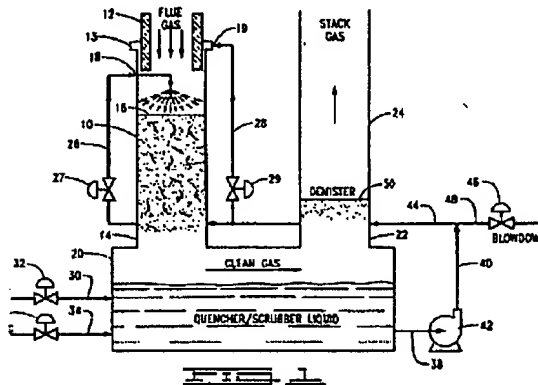
"if desired, a polishing scrubber may be used to further purify the gaseous products."

Applicants find it difficult to believe that the Office proposes that this one statement is sufficient to establish a *prima facie* case of obviousness. Notably, the Office has not pointed out to

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applicants exactly where this polishing column is located in the drawings of Knapp, whether a liquid scrubbing medium is introduced, or what the size of the scrubber is in relation to the first scrubber unit.

Figure 1 of Knapp is recreated below for ease of reference.



Interestingly, the only second unit that the Knapp reference describes that might conceivably be considered a polishing column is a demister 50, which accepts the gas after its passing through the quencher/scrubber. Specifically, the Knapp reference recites that:

"the cleaned and cooled gas leaving column 10 via exit 14 is passed through an appropriate device, such as a demister 50, to **remove the droplets of quencher/scrubber liquid that are usually entrained in the cleaned gas as a result of the liquid cleaning process.**" (emphasis added)

Clearly, this second stage is not a scrubbing unit, and there is certainly no additional scrubbing by a liquid medium, because the purpose of the demister is to remove the entrained liquid from the scrubbing column 10. Thus, the proposed combination of Knapp and Macedo, et al. would defeat the purpose of Knapp to remove any remaining quencher/scrubber liquid.

As stated numerous times, the Office has not provided objective or specific teachings or suggestions in the cited prior art to go in the direction of applicants' claimed invention. Obviousness cannot be established by modifying the teachings of the cited references to produce the claimed invention, absent some teaching or suggestion of the desirability of such

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modification. Applicants respectfully submit that the Office's statement "that the claimed invention would be obvious to one having ordinary skill in the art" is not sufficient by itself to establish *prima facie* obviousness. The Office must explain with **specificity what areas of the reference would suggest the modification to go in the direction of applicants' claimed invention.**

It is incumbent on the Office to provide some suggestion or teaching in the prior art that would lead one skilled in the art to proceed in the direction of applicant's claimed invention. The Office has not provided objective or specific teachings or suggestions in the cited prior art that would motivate one skilled in the art to modify the cited references. What is the asserted motivation put forth in any of the cited references to reduce the size of the second scrubber unit? Clearly, neither Macedo, et al. nor Dahlstrom, et al. discusses the importance of minimizing the overall volume of the secondary chamber.

The Courts have addressed this issue numerous times and have stated "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990) quoting *In re Gordon* 221 USPQ 1125 (Fed. Cir. 1984). It was further stated by the *Mills* Court that "[I]t is not pertinent whether the prior art possesses the functional characteristics of the claimed invention if the reference does not describe or suggest its structure." Thus, this allegedly "obvious" modification is supported only by the Office's reinterpretation of the art in light of applicants' disclosure.

The Office further states "there is no disclosure in either reference requiring the second scrubber to be bigger than the first scrubber," making reference to Macado, et al. and Dahlstrom, et al. The Office has made applicants' point that the cited references DO NOT teach or suggest to go in the direction of applicants' claimed invention because neither reference makes any reference to the second scrubber size. Applicants submit that the fact that neither cited reference provides any discussion relative to the size of the second scrubber units is another indication that the references do not recognize the importance of correctly sizing the second scrubbing chamber in the manner of applicants' claimed invention.

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Again, applicants remind the Office, that to meet its burden of establishing a *prima facie* case of obviousness, the Office must provide some basis of suggestion to modify the cited references and reconfigure the dual scrubbing system so that the second scrubbing unit is smaller than the first scrubbing unit. This is not possible, since the Office has already admitted that the cited references do not address the size of the second scrubbing unit.

Applicants do not agree with the Office that the presently claimed abatement process that includes a smaller secondary scrubbing unit relative to the first scrubbing unit was the result of obvious experimentation, since such experimentation would not have come from within the teachings of any of the cited references. The Office's position, in essence, is that applicants have done nothing more than use routine experimentation to optimize the size of the second scrubbing unit. However, conspicuously missing from the record is any substantive evidence that one of ordinary skill in the art would have been motivated to make the modifications of the prior art and select a smaller diameter second scrubbing unit to arrive at applicants' claimed invention. Further, the Office's argument that "routine experimentation" was involved in determining the optimal range of the second scrubbing unit, shows that the Office overlooked the last sentence of 35 USC §103, which states that "[p]atentability shall not be negated by the manner in which the invention was made." *In re Fay*, 146 USPQ 47 (CCPA 1965).

Applicants further point out that this rejection amounts to the application of an "obvious to try" standard, which is an improper standard for a §103 rejection. The Office contends that because the cited references discuss two scrubbing units, there is sufficient teachings or suggestions to make the claimed invention obvious. However, simple statements regarding the use of a two stage scrubbing system provides no guidance toward the present invention wherein the second scrubbing unit has a smaller diameter than the first unit.² Clearly, the prior art has not provided any derivative basis for the presently claimed scrubbing system. Further, none of the cited

² The admonition that "obvious to try" is not the standard Under §103 has been directed mainly at two kinds of error. In some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous possible choices until one possibly arrived at a successful result, where the prior art gave either no indication of which parameters were critical or no direction as to which of many possible choices is likely to be successful. E.g., *In re Geiger*, 2 USPQ 2d 1278; *Novo Industri A/S v. Travenol Laboratories Inc.*, 215 USPQ 412 (7th Cir. 1982); *In re Yates* 211 USPQ 1149 (CCPA 1981); *In re Antonie* 195 USPQ 8-9. In others, what was "obvious to try" was to explore a new technology or general approach that seemed to be a promising field of experimentation, where the prior art gave only general guidance as to the particular form of the claimed invention or how to achieve it. *In re Dow Chemical Co.*, 5 USPQ2d 1529 (Fed. Cir. 1985); *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81 (Fed. Cir. 1986); *In re Tomlinson*, 150 USPQ 623 (CCPA 1966).

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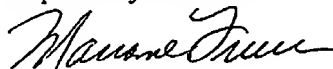
references recognizes the advantages of a smaller second scrubbing unit, or provides any guidance to go in the direction of applicants' claimed invention.

In conclusion, and in light of the above discussion, applicants contend that the Office has not met its burden of establishing a *prima facie* case of obviousness. As such, the rejection of all claims under 35 U.S.C. 103(a) for obviousness must be withdrawn.

Conclusion

The pending claims 21, 26-27, 51-54, 57-58 and 61-62, as now amended, meet all disclosure requirements and patentably distinguish over the prior art, and in view of the forgoing remarks, it is respectfully requested that all rejections be withdrawn, thereby placing the application in condition for allowance. Notice of the same is earnestly solicited. In the event that any issues remain, Examiner Nguyen is requested to contact the undersigned attorney at (919) 419-9350 to resolve same.

Respectfully submitted



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